EXAMINETHE EFFECTS OF COGNITIVE ABILITYON THE PERFORMANCE AND LEARNING ABILITY OF INTERSCHOOL CHESS PLAYERS

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BY

NILKANTH ASHOKRAO SHRAVAN

UNDER

RESEARCH SUPERVISOR

DR. D. U. HAMBARDE

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Abstract

‘Examine the Effect of Cognitive Ability on The Performance and Learning Ability of Interschool Chess Players’’

Introduction :

A significant amount of research supports the positive relationship of cognitive abilitywith job performance (Hunter & Hunter, 1984; Humphreys, 1992). Cognitive ability has beenshown to predict the occupation to which an individual belongs (Austin &Hanisch, 1990),training success (Ree&Earles, 1992), and various measures of productivity or job performance(Hunter, 1986; Schmidt & Hunter, 1992). In fact, based on the substantial amount of researchregarding cognitive ability tests, Ree and Earles (1992) stated that "If an employer were to useonly intelligence tests and select the highest scoring applicant for each job, training resultswould be predicted well regardless of the job, and overall performance from the employees selected would be maximized," (p. 88).However, past cognitive ability research has primarily focused on the individual as theunit of analysis. Most research has been concerned with examining the validity of certain testsfor predicting job performance in the context of personnel selection. Thus, not surprisingly,existing research has examined the relationship between an individual's scores on a particularcognitive ability measure and measures of the individual's job performance. While this researchis consistently supportive of the relationship, recent trends in the redesign of work to focus onself-managing work teams might lead to questions as to whether or not the relationship exists athigher levels of analysis.

Thus, the nature of the task is relatively complex, and is characterized by reciprocalinterdependence (Thompson, 1967). The nature of the interdependence speaks for examiningcognitive ability at the group level of analysis. Moeller, Schneider, Schoorman, and Berney(1988) recommended that researchers should collect their data at the level of analysis at whichthey intend to aggregate. Because our study sought to predict team performance, this requiredusing a team measure of cognitive ability.It is important to note that other constructs traditionally viewed at the individual level ofanalysis such as affect, absence, prosocial behaviour, performance, and turnover have also beenexamined as group, as opposed to individual level, phenomena (George, 1990; George &Bettenhausen, 1990). For example, George (1990) found that negative affectivity within a groupwas negatively related to the extent to which the group engaged in prosocial behaviour. Inaddition, George and Bettenhausen

(1990) found that prosocial behaviour measured at the grouplevel was significantly correlated with the group's objective sales performance.

A similar movement from the individual to the group level of analysis might be of interestwith regard to cognitive ability. An example of approaching cognitive ability at the group (in thiscase the firm) level of analysis is a recent study by Terpstra and Rozelle (1993). These authorssurveyed firms as to whether or not they used some popular selection practices, one of whichwas cognitive ability testing. The results indicated that the use of cognitive ability tests wasstrongly related to firms' performance as measured by annual profit, profit growth and salesgrowth for service industries, but was not related to performance in other industries. It isimportant to note that this study assumed that firms that do use these tests should have higheraverage cognitive ability than firms that do not. Thus, it is apparent that the results seem toindicate some support for the notion of a group's ability being related to that group'sperformance.

Similarly, viewing cognitive ability at the team level, it is entirely possible theoreticallythat a team's average cognitive ability should be related to the team's performance. Substantialresearch demonstrates that cognitive ability primarily affects job performance through theacquisition of job knowledge (Hunter, 1986; Schmidt & Hunter, 1993) at the individual level. Theacquisition of job knowledge at the individual level among highly interdependent individualsshould be related to team performance for three reasons.

First, team performance requires that all of the individuals to acquire relevant jobknowledge in terms of offensive schemes, defensive schemes, and appropriate reactions tocertain game situations. Offensive schemes include set plays as part of the offense or offensivepatterns while defensive schemes.

This job knowledge is usually gained through extensive in class (team meetings/playbook) and on (practice) activities. Cognitive ability should enable team members to more quicklylearn the offensive and defensive schemes and to make better on the court decisions for theirown individual roles.

Second, in addition to the generic offensive and defensive schemes, adaptations aremade for each opponent during the season. Prior to each contest, team members arepresented with scouting reports that indicate the opponents' plays as well as offensive anddefensive tendencies. Team members watch films of their opponents, and are required to learnthe things that the opposing team is likely to do (e.g., their out of bounds plays, offensive plays,likely defences, etc.) and how the focal team will counter them. Additionally, players may

berequired to learn the particular tendencies of individual opponent players (e.g., where the team'sleading scorer likes to get the ball, where he likes to shoot from, where and how the leadingrebounder tends to position himself, etc.) and how to counteract them. All this information mustbe assimilated in usually 2-3 days. Further adjustments to the game plan must be made at halftime, and players must be able to quickly assimilate the knowledge and revised game planduring that time. Again, cognitive ability should increase the capacity of players to successfullyassimilate this information in a short time frame.

Third, additional on-the-spot decision making takes place during the game. Players arerequired to recognize particular situations, and react accordingly. This requires recognizingsituations and reasoning through to determine the appropriate course of action. Cognitive abilityshould be related to team members' ability to quickly recognize and adapt to new situationsfaced during the game.

Finally, in a highly interdependent situation such as a basketball team, all individualsmust learn their fellow team members' preferences, tendencies, strengths, and weaknesses.For example, if one player is particularly adept and comfortable shooting from certain spots onthe floor, or at certain angles, it is important for teammates to recognize this and to ensure thatthe player gets the ball in the places that he will be most effective. Cognitive ability shouldenable team members to more quickly and thoroughly acquire this type of required jobknowledge.

Reviews of Related Literature:

1. D&D's view, because intuitive knowledge is context dependent; M&E's view, because advanced heuristics are specific to a particular domain; and G&C's view, because knowing-how is linked to specific perceptual knowledge. Recent reviews of literature about chess, music and working memory training all concluded that transfer is indeed difficult and rare (**Sala and Gobet, 2016**, 2017a, 2017b).

2. Bart (2014) claim that since chess is a demanding task involving focused attention and problem solving; playing chess should strengthen these cognitive abilities and thus be beneficial for children's school performance. Chess supply the facilities for developing of mathematical and reading skills and also cognitive abilities (**Sala &Gobet, 2016**). Another important and current results

show that chess training improve Pisa scores in Mathematics (Trinchero& Sala, 2016).

3. In recent meta-analyses (**Sala &Gobet, 2016a**, 2017, in press), we evaluated the evidence of transfer in three domains (chess, music and working memory training). In all cases, we focused on healthy children and young adolescents.

4. To do this, the chess test T23 (Brasó, 2014) was used to find correlations between the different characteristics and the results obtained in the test. This study is comparable with other projects that have analyzed similar variables related to chess and education (Aciego, García, Betancort, 2012; Baddeley, 1998; Barón, 2009; Binet, 1894; Blanch, 2016; Brasó, 2007 Brasó, , 2010a Brasó, , 2010b Brasó, , 2014 Chase & Simon, 1973; D'Eredità& Ferro, 2015; De Groot &Gobet, 1996; Frydman& Lynn, 1992; García, 2001; Gobet& Clarkson, 2004; Gobet, Lane &Lloyd-Kelly, 2015; Gobet& Simon, 1998; Hearst, Knott, 2009; Kovacic, 2012; Laplaza, 2001; Pereira, Pavanati&Perassi, 2011; Pino, Martí, Rodríguez & Pérez, 2009; Pozo, 2000; Quiroga, 1998; Ross, 2006; Ruiz, 1994; Saarilouma, 1995; **Sala &Gobet, 2016;** Simon, 1979; Waters, Gobet, Leyden, 2002). In this case, the hypothesis were designed to find links between the results obtained in the test and different variables of the participants in the study, for example: previous experience, gender, academic average, and the perception the subjects had of their level in relationship with reality.

5. Given the near-absence of studies controlling for placebo effects in this line of research, it is essential to replicate and extend this work. First, since the duration of treatment seems to be positively related to the effect of chess instruction on cognitive and academic outcomes (**Sala &Gobet, 2016**), future studies should directly manipulate this variable, in order to understand the optimal duration of chess courses. Second, given that the positive effect of chess instruction does not appear superior to the regular curricular activities, it would be interesting to compare the effect of chess interventions held during school hours with the effect of chess interventions held during extra-curricular hours.

Statement of the problem:

In the light of the above, the investigator becomes interested in determining the Effect of Cognitive Ability on The Performance and Learning Ability of Interschool Chess Players. The problem was stated ‘’Examine the Effect of

Cognitive Ability on The Performance and Learning Ability of Interschool Chess Players''

Objectives of Research:

1. The primary aims of the study are to Effect of Cognitive Ability on The Performance and Learning Ability of Interschool Chess Players.

2. The another objectives of the study is the cognitive ability and The cognitive function on learning ability of chess players.

Hypothesis:

The Following alternative hypothesis will be formulated for present study are as :

1. There will be no significant effects of cognitive function on performance of chess players.
2. There will be no significant effects of cognitive ability on learning ability of chess players.

Delimitations of the study:

1. Study was conducted on 200 experimental chess players. The test and training programme cognitive ability & learning ability will be conducted for experimental group only.
2. The age group of sedentary student was 12-19.
3. The study was delimited to interschool chess players only.

Limitations of the study:

1. The background of the subject will not be considered in this study.
2. No motivational techniques will be used during the test.
3. Inherent potential of the subjects will unknown.

Definitions and Explanations of terms:

Definition of the Term Cognitive Ability:

Cognitive abilities are brain-based **skills** we need to carry out any task from the simplest to the most complex. They have more to do with the mechanisms of how we learn, remember, problem-solve, and pay attention, rather than with any actual knowledge

Cognition is "the mental action or process of acquiring knowledge and understanding through thought, experience, and the senses".[1] It encompasses processes such as knowledge, attention, memory and working memory, judgment and evaluation, reasoning and "computation", problem solving and decision making, comprehension and production of language. Human cognition is conscious and unconscious, concrete or abstract, as well as intuitive (like knowledge of a language) and conceptual (like a model of a language). Cognitive processes use existing knowledge and generate new knowledge.

Definition of the Term Learning Ability:

Over your life, you are collecting a lot of memories in your head. What are these memories? They are pictures, sounds and feelings. So, if you learn something you have one or more of these in your head when you remember it later.

So, if you are a thinking being, you have the ability to learn. And computers also can learn if they are programmed that way. One day you won't be able to tell the difference between a Computer and a human except that the human really feels.

Methodology to be adopted:

Methodology :

This chapter explained the methodological details used to implement the study. Specifically, presented here are the general perspective and context of the study, an overview of the participants and a description of the procedures used in data collection, and an explanation of data analysis.

Target Population:

200 students will be targeted as experimental student group. This group will be considered as experimental group and as well as control group. The tests and training program will be conducted for this group only.

Sampling method:

The study depends mainly on primary source of data. The data will be collected through respondents in the form of Questionnaires and experimental test from 200 students.

Universe of the study:

The universe of the study will be students who have been studying at inter school level under the jurisdiction of 6^{th} to 12^{th} standard (i.e. age group of u14, u17 & u19).

cognitive ability on learning ability of chess players:

Cognitive abilities are brain-based **skills** we need to carry out any task from the simplest to the most complex. They have more to do with the mechanisms of how we learn, remember, problem-solve, and pay attention, rather than with any actual knowledge

Over your life, you are collecting a lot of memories in your head. What are these memories? They are pictures, sounds and feelings. So, if you learn something you have one or more of these in your head when you remember it later.

So, if you are a thinking being, you have the ability to learn. And computers also can learn if they are programmed that way. One day you won't be able to tell the difference between a Computer and a human except that the human really feels.

Demographic information:

The data will be collected through respondents in the form of different test, the demographic information about Gender, age, daily smoking, etc. was obtained before seeking responses.

Ethical consideration :

In collecting the data, the researcher follow to ethical guidelines, principles and standards for studies conducted with human beings. The study included safeguards for protecting humans, which involved three major ethical principles : beneficence, respect for human dignity and human justice. Beneficence is the protection of participants from physical and psychological haem, exploitation and performance of some good.

Inclusion and exclusion criteria:

The inclusion and exclusion criteria for participants were as follows :

1. The participants agreed to participate in the study via an informed consent.
2. The participant must be interschool students aged range between 12 to 19 years.
3. The participant were not rotating through other health facility at the time of study.

The Exclusion criteria are:

1. Active physical illness. The participants advised not to participate if under any injuries and management.
2. Inability to obtain the consent of the respondent.
3. Participants free from the smoking, drug abuse.

Research design:

The research design refers to the researchers overall plan for testing the research hypothesis. This study involves a cross sectional, comparative test of the students as experimental research. Science experimental group will be taken by the investigator so this study will be conducted in an experimental design.

Selection of variables:

Following Two variables will be selected.

1. Cognitive Ability
2. Learning Ability

Administration of the test:

The data will be collected before and after training to the students through test and other tools. The instructions was given by the investigator to the students before taking the test.

Source of data :

The study depends mainly on primary source of data.

Data processing:

Data processing play very significant role in the interpretation of numerical data obtained from individuals by giving numerical expressions to the relationships and the variations with respect to different aspects. The collected data was analysed as a whole and fragments. The data was checked for accuracy and completeness and was code and put up in to the SPSS descriptive statistics for all studies variables was considered statistically techniques throughout the study.

Importance of study / society application :

The findings of the study will be useful in assisting educators, counsellors, psychologist and researchers to develop strategies to enhance students. The findings of this study will be implication for health professionals working with students, it will provide empirical validation of cognitive ability on the performance and learning ability of the students.

Proposed work plan / Formulation and structure of study :

1 st Year	Literature collection
	Submission of progress report
	Pilot study
	Submission of progress report
	Start test
2 nd Year	Detail study
	Data collection
	Compilation of data
	Prepration of research paper
	Submission of progress report
	Submission of utilization certificate
3 rd Year	Use of SPSS software
	Prepration of graphs
	Data interpretation
	Final complitation of data
	Prepration of research paper & communicating it for publication
	Report writing
	Submission of final report

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Research student SHRAVAN NILKANTH ASHOKRAO

Research Guide DR. DINKAR U. HAMBARDE